WHAT IS CLAIMED IS:

1. An integrated Low Dropout (LDO) linear voltage regulator providing improved current limiting, comprising:

a 2-input, 1-output differential voltage amplifier, a first input receiving a reference voltage;

a circuit to sense the output voltage of the voltage regulator and couple it to a second input of the differential voltage amplifier in a manner that provides negative feedback;

a series pass transistor connected to the output of the difference voltage amplifier;

a current sense transistor coupled to the series pass transistor using current mirroring to monitor the current passing through it;

a reference current source coupled to the output of the current sense transistor; and

the junction of the current sense transistor and the reference current source being connected to the difference voltage amplifier in a manner that increases an apparently sensed output voltage as the current through the current sense transistor exceeds the reference current value.

2. The integrated Low Dropout (LDO) linear voltage regulator as in claim 1, wherein the differential voltage amplifier is a long-tailed pair having a constant current source for providing a tail current.

3. The integrated Low Dropout (LDO) linear voltage regulator as in claim 1, wherein the circuit for sensing the output voltage of the voltage regulator comprises a direct connection of the output of the voltage regulator to the second input of the difference amplifier.

4. The integrated Low Dropout (LDO) linear voltage regulator as in claim 2, wherein the junction of the current sense transistor and the reference current source is connected to the control terminal of a current limiting transistor that is connected in parallel with the transistor of the long-tailed pair that has its control terminal as the second input of the difference amplifier.

5. A method for improving current limiting in an integrated low Drop Out (LDO) linear voltage regulator, comprising:

receiving a reference voltage at a first input of a difference voltage amplifier;

sensing a regulator output voltage;

applying the sensed regulator output voltage to a second input of the difference voltage amplifier in a manner that provides negative feedback;

sensing current passing through the regulator output;

comparing the sensed current to a reference current; and

controlling operation of the difference voltage amplifier in a manner that increases the apparently sensed regulator output voltage if the sensed current exceeds the reference current.

6. The method as in claim 5, wherein applying the sensed regulator output voltage comprises directly connecting the sensed regulator output voltage regulator to the second input of the difference voltage amplifier.

7. A low drop-out voltage regulator, comprising:

a differential amplifier stage including:

a differential amplifier having first and second differential inputs, the first differential input coupled to an output of the regulator and the second differential input coupled to a reference voltage; and

a current control transistor coupled to one branch of the differential amplifier; and

an output stage including:

a pass transistor coupled between a regulator input and the regulator output and controlled by an output of the differential amplifier; and

a current sensing transistor coupled between the regulator input and the current control transistor of the differential amplifier.

8. The regulator of claim 7 wherein a first reference terminal of the differential amplifier is coupled to the regulator input and a second reference terminal of the differential amplifier is coupled to ground.

9. The regulator of claim 8, wherein the differential amplifier stage further includes a tail current transistor coupled between the second reference terminal and ground.

10. The regulator of claim 7, wherein the output stage further includes a biasing transistor coupled between the pass transistor and ground.

11. The regulator of claim 7, wherein the output stage further includes a current limiting transistor coupled between the current sensing transistor and ground.

12. A regulator, comprising:

a regulator input;

a regulator output;

a differential amplifier coupled to the regulator input and having first and second current paths associated with corresponding first and second differential input and an output in the second current path, the first differential input coupled to the regulator output and the second differential input receiving a reference voltage;

a current control transistor coupled to a first current path;

a pass transistor coupled between the regulator input and regulator output and having a control terminal coupled to the differential amplifier input; and

a current sensor to sense current at the regulator output and generate a control signal applied to the current control transistor.

13. A method, comprising:

sensing an output regulated voltage;

comparing the output regulated voltage to a reference voltage;

controlling the output voltage through negative feedback to substantially match the reference voltage;

sensing a current associated with the output voltage;

comparing the sensed current to a reference current;

if the sensed current exceeds the reference current, then overriding the sensing of the output regulated voltage to sense an apparent, higher, voltage.

14. A regulator, comprising:

a negative feedback voltage control circuit that senses an output regulated voltage and controls that sensed output regulated voltage to substantially match a reference voltage;

a current sensor that senses a current associated with the output regulated voltage and compares the sensed current to a reference current; and

a feedback control circuit responsive to sensed current exceeding the reference current to override the negative feedback voltage control circuit sensing of the output regulated voltage to sense an apparent, higher, voltage.

15. The regulator of claim 14 wherein the negative feedback voltage control circuit comprises:

a differential amplifier including first and second mirrored current paths, a current flowing in the first current path being controlled by the output regulated voltage, and a current flowing in the second current path controlling the sensed output regulated voltage to substantially match the reference voltage;

an override circuit coupled to the first current path and responsive to the feedback control circuit to maintain current flowing in the first current path as the output regulated voltage decreases.